

Measuring adolescent attitudes towards dementia: the revalidation and refinement of the A-ADS

Article (Accepted Version)

Farina, Nicolas, Griffiths, Alys W, Hughes, Laura J and Parveen, Sahdia (2022) Measuring adolescent attitudes towards dementia: the revalidation and refinement of the A-ADS. *Journal of Health Psychology*, 27 (2). pp. 374-385. ISSN 1359-1053

This version is available from Sussex Research Online: <http://sro.sussex.ac.uk/id/eprint/93027/>

This document is made available in accordance with publisher policies and may differ from the published version or from the version of record. If you wish to cite this item you are advised to consult the publisher's version. Please see the URL above for details on accessing the published version.

Copyright and reuse:

Sussex Research Online is a digital repository of the research output of the University.

Copyright and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable, the material made available in SRO has been checked for eligibility before being made available.

Copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

Measuring Adolescent Attitudes towards dementia: The validation of the Brief A-ADS

SHORT TITLE: VALIDATION OF THE BRIEF A-ADS

Nicolas Farina, Alys W. Griffiths, Laura J. Hughes, and Sahdia Parveen

Author Note

Nicolas Farina, Centre for Dementia Studies, Brighton and Sussex Medical School, Brighton, East Sussex. BN1 9RY.

Alys W. Griffiths, Centre for Dementia Research, School of Health and Community Studies, Leeds Beckett University, City Campus, Leeds, LS1 3HE

Laura J. Hughes, Centre for Dementia Studies, Brighton and Sussex Medical School, Brighton, East Sussex. BN1 9RY.

Sahdia Parveen, Centre for Applied Dementia Studies, Faculty of Health, University of Bradford, Richmond Road, Bradford, West Yorkshire, BD7 1DP

Corresponding author: Nicolas Farina (N.farina@bsms.ac.uk), TEL: +441273 878995

Acknowledgements

Thank you to the secondary schools and adolescents that participated in the research. We are particularly appreciative of the staff within the schools who helped facilitate the research. The project was internally funded by the Centre for Dementia Studies, Brighton and Sussex Medical School.

Sponsorship

Ethical approval and sponsorship was obtained from Brighton and Sussex Medical School.

Accepted Manuscript

Measuring Adolescent Attitudes towards dementia: The revalidation and refinement of the A-ADS

Abstract

The A-ADS is one the first validated measures of attitudes of dementia in adolescents, though further validation is needed. 630 adolescents were recruited from secondary schools in England. A Principal Component Analysis was completed (n=230) followed by a Confirmatory Factor Analysis (n=400). Reducing the A-ADS into a single factor, 13-item measure (Brief A-ADS) improved the model fit of the measure ($\chi^2=182.75$, DF=65, CMIN/DF= 2.81, $p<0.001$, CFI=0.90, RMSEA = 0.07). The scale demonstrated good internal consistency, good predictive and concurrent validity. Building on the validation of the A-ADS, the Brief A-ADS is suitable to capture attitudes towards dementia amongst adolescents.

Keywords: Stigma, young people, behaviour, intention, schools, psychometrics, internal consistency

Public stigma and misconceptions towards dementia is widespread (Alzheimer's Disease International, 2019). Stigma can lead to a people with dementia being socially isolated, not sharing their diagnosis or avoiding seeking support (Alzheimer's Disease International, 2019; Alzheimer's Society, 2008, 2012; Iliffe et al., 2005; Milne, 2010). Theoretically, raising awareness of dementia is a key mechanism to reduce stereotypes and prejudice towards people living with the condition (Mukadam and Livingston, 2012). It is therefore unsurprising that raising awareness around dementia is at the forefront of international policy (Alzheimer's Disease International, 2019; Batsch and Mittelman, 2012; Department of Health, 2009; Scottish Government, 2013; World Health Organisation, 2017).

There are a number of initiatives in existence that aim to change attitudes towards dementia which are usually focused on adult populations, healthcare professionals or healthcare students (Banerjee et al., 2017; George et al., 2013). Comparatively, there have been far fewer initiatives developed for younger people, despite there being evidence that stigmatising attitudes and misconceptions towards dementia already exist amongst adolescents (Cowley, 2005; Farina, Hughes, Griffiths, et al., 2020; Isaac et al., 2017). Crucially, both the *impressionable years hypothesis* and *increasing persistence hypothesis* suggest that people are more susceptible to attitude change earlier in life, albeit for different theoretical reasons (Glenn, 1974; Krosnick and Alwin, 1989; Marinova, 2013; Visser and Krosnick, 1998). The *impressionable years hypothesis* states that when individuals are young, experiences have a profound impact on their thinking. Once these early years have passed, attitudes become more resistant to change (Docking and Stock, 2017; Krosnick and Alwin, 1989). In the *increasing persistence hypothesis*, attitudes are believed to be flexible and responsive to social situations when young, though as they age, this flexibility gradually decreases (Krosnick and Alwin, 1989; Mortimer and Shanahan, 2006).

Several dementia awareness initiatives aimed at young people have been developed, usually delivered through schools (Atkinson and Bray, 2013; Chow et al., 2018; Di Bona et al., 2017; Nazir and Bangash, 2015; Parveen et al., 2015; Rylance and Pendleton, 2015). These initiatives tend to evaluate dementia attitude change using qualitative methods or single-item questions. However, none of these initiatives have been evaluated using validated measures. This might be in part due to a lack of validated measures developed for use in young people. Only a single dementia awareness initiative (KIDS4Dementia) aimed at Australian young people (9-12 years old) (Baker et al., 2018) has been empirically evaluated using the authors' Kids Insight into Dementia Survey (KIDS)(Baker et al., 2017). KIDS is made up of three factors; '*Personhood*,' '*Stigma*,' and '*Dementia Understanding*,' and demonstrates overall good internal consistency ($\omega_t = 0.83$).

The value of using standardised measures are well documented; allowing us to have a more objective outcome and allowing outcomes to be compared across initiatives and settings. The lack of empirical evaluation of such initiatives, including dementia friendly initiatives more broadly (Hebert and Scales, 2017), may also be attributable to the notion that they are 'inherently good' and therefore do not warrant the same level of scrutiny. However, there is evidence that anti-stigma strategies are not all equal, with some being less effective, whilst others causing harm through concretising negative stereotypes (Mental Health Commission of Canada, 2013).

The Adolescent Attitudes towards Dementia Scale (A-ADS) is the first measure specifically designed and developed to capture attitudes towards dementia amongst British younger people, specifically aimed at those aged 13 to 18 years old (Griffiths et al., 2018). The scale has three underlying factors; '*perceptions of dementia*,' '*empathy*' and '*personal sacrifice*' ($\alpha > 0.60$). Scores on this scale correlate with other measures of attitudes towards dementia, originally validated amongst adult populations (i.e. Dementia Attitudes Scale,

Attitudes towards Older People Scale, Lundquist & Ready Scale; (Kogan, 1961; Lundquist and Ready, 2008; O'Connor and McFadden, 2010) ($r = .49 - .94$). However, the A-ADS only been validated in a single UK sample, and as the original authors stated, there is a need to confirm the construct validity of the model using a Confirmatory Factor Analysis (CFA)(Griffiths et al., 2018) demonstrating strong statistical underpinnings to the scale.

The present study aimed to further validate the A-ADS in a sample of adolescents from the South of England, this was achieved first by running an Exploratory Factor Analysis (EFA) followed by a CFA. The secondary aim was to understand whether it was possible to reduce the number of items in the A-ADS, without effecting its validity, so to further promote its use in settings where time is at a premium.

Methods

Sample

A sample of adolescents (ages 13-18) were recruited from secondary schools in South East England. Approvals were obtained from the Head Teacher or Deputy Head Teacher prior to approaching the students. The survey was distributed by teachers within school time, apart from age there was no additional inclusion or exclusion criteria. All participants were provided information sheets prior to participation, with the opportunity to opt-out of the research. Nine-hundred and one adolescent participants were recruited across four schools, further details about the whole sample have been reported elsewhere (Farina, Hughes, Griffiths, et al., 2020).

For this study, participants were only included if they had no missing data from the A-ADS measure ($n=630$). This sample was randomly split into two (using SPSS), so that EFA and CFA could be run separately. For the EFA, 230 participants were randomly selected and were

on average 15.0 years old ($SD=1.45$), female ($n=130$, 56.8%), and predominantly White British ($n=177$, 83.1%). The remaining 400 participants included in the CFA were on average 14.9 years old ($SD=1.48$), female ($n=230$, 57.8%) and predominantly White British ($n=290$, 72.5%). There was no significant difference between the split samples on age ($U=44962$, $p=0.79$), gender ($\chi^2=0.06$, $p=0.80$) or ethnicity ($\chi^2=1.51$, $p=0.22$).

Materials

Age, gender and ethnicity (free-text) were captured.

The A-ADS (Griffiths et al., 2018) is a 23 item scale that captures attitudes towards dementia in adolescents. Items are rated on a 5 point Likert scale. The scale is composed of three factors, '*perceptions of dementia*', '*personal sacrifice*' and '*empathy*' with people living with dementia. Higher scores represent better attitudes towards dementia. See Appendix A for total score syntax.

The Allophilia scale (Kinney et al., 2017; Pittinsky et al., 2011) is a 17-item questionnaire of positive attitudes towards outgroups (i.e. dementia). As per previous recommendations, a single item "I would like to be more like someone with dementia" was removed from total analysis (Pittinsky et al., 2011). Items are rated on a 6 point Likert scale. Higher scores represent more positive attitudes towards dementia.

Analysis

EFA: A Bartlett's test of sphericity and Keiser-Meyer-Olkin (KMO) were checked prior to EFA to confirm the suitability of the data EFA. A Principal Component Analysis (Direct Oblimin Rotation) was run in which factors were reported based on having an Eigenvalue > 1 and visual inspection of the scree plot. Percentage of variance factors

accounted for were reported. After the initial EFA, the Velicer's minimum average partial (MAP) test (Velicer, 1976) and parallel analysis (Horn, 1965) were ran to provide an alternative indicator of factors, utilising a syntax reported elsewhere (O'Connor, 2000). This informed whether an alternate forced factor model should be explored.

Decisions about item retention were made by initially reviewed the factor loadings, considering how the items are theoretically grouped, and whether there were similarities with the original A-ADS factor structure. However, we also used statistical outcomes to help inform our decision making. Item loadings > 0.4 were consider as adequate fit, and > 0.6 consider good fit. In cases where cross loading occurred (i.e. items loaded on multiple factors), the factor that the highest loading was chosen as. Item loadings less than 0.6 were also required to not cross-load onto a second factor (defined as being within by 0.2 absolute difference between item loadings). Cross-loading can be problematic, and absolute difference of 0.2 has been suggested to be a threshold between a small and large difference, thus warranting item removal (Ferguson and Cox, 1993). In line with previous guidance, factors were required to contain three items (Yong and Pearce, 2013).

Internal consistency was then checked using Cronbach's alpha, including confidence intervals (CIs). Items were subsequently removed if the item removal improved the Cronbach's alpha outside of 95% CIs. Concurrent validity was assessed through a correlation between the A-ADS and the Allophilia scale. Predictive validity was assessed through a t-test between people that agreed and disagreed to the statement "In general, I have positive attitudes about people with dementia". This question is taken from the Allophila scale and response format was dichotomised.

CFA: A structural equation model was created (AMOS) using Maximum Likelihood Estimation. Two models were created 1) using the three factor structure described in Griffiths

et al., (2018), and 2) using the factor structure of the 13-item A-ADS identified in the EFA. Model fit was assessed using the following statistics: the χ^2 statistic, the Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA). A non-significant χ^2 indicates a good model fit. A χ^2/DF ratio between 1 and 3 indicates an acceptable fit between the hypothetical model and sample data. A SRMR value below 0.08 indicates good fit. For the RMSEA, values less than 0.08 indicate a reasonable error of approximation, whilst the CFI value ≥ 0.90 is indicative of good fit. As the purpose was to determine the suitability of the A-ADS factor structure, no attempts were made to improve or change the model fit.

Similar to the EFA, psychometric properties were reported for the 13-item A-ADS and 23-item A-ADS. In addition, a Pearson's correlation was run between the 13-item A-ADS and 23-item A-ADS.

Readability: In consideration of the practicalities of using the 13-item A-ADS in an adolescent age group, we also examined the readability of the text. Four readability statistics were calculated for the item text, providing an US grade-level readability, which were converted into age by adding 6. A final index of readability age was calculated by averaging scores across readability statistics. The procedure of calculating this is described in detail elsewhere (Patalay et al., 2018).

Ethics

Ethical approval was obtained from the Brighton and Sussex Medical School Research Governance and Ethics Committee.

Data Sharing Statement

We regret that publishing anonymised study data is not possible because informed consent was not obtained from participants to allow the data to be used in this manner.

Results

Exploratory Factor Analysis

Bartlett's test of sphericity confirmed that correlations between items were large, $\chi^2(253) = 1823.24, p < .001$. A KMO test indicated suitable sample size for EFA (KMO = 0.88), with an item-participant ratio of 10:1. A Principal component analysis revealed five factors that loaded (Eigenvalue > 1), accounting for 55.55% of the variance. The parallel analysis of 1000 data sets using 95% cut-off was conducted. The first five eigenvalues extracted from the simulation were 1.73, 1.60, 1.50, 1.43, and 1.36. In the actual data, the only the first two eigenvalues of 7.07 and 1.93 exceeded chance values, suggesting that a two factor structure underlies the data. For the MAP test, the smallest average fourth power partial correlation was 0.0005; only two factors had higher correlations (0.012 and 0.0008 respectively), also indicating a two factor solution.

After reviewing the component matrix and loadings in a five factor (Table 1), and forced two factor model (Table 2), only a single factor had items with; a) high item loadings and, b) did not cross-load onto other factors. The choice to focus on a single factor solution was further supported by the fact that a second factor, did not have appear to have a common theme linking the items. Several items loading onto the second factor appear to represent “I feel” or “I would feel” statements, but these often also more often strongly loaded on the first factor. Importantly, the second factor items did not closely represent any factor from the

original 23-item A-ADS factor structure (i.e. items spanned empathy, perceptions and sacrifice).

In adopting a single factor structure, the scale had 13 items, with a good internal consistency, $\alpha = 0.88$ (95% CI, 0.85-0.90). Individual item removal would not have improved the internal consistency of the factor. The 13-item A-ADS had good concurrent validity with the total Allophilia scale ($r = .77, p < .001$). The 13-item A-ADS also had good predictive validity, being able to differentiate between people who self-report having positive attitudes toward dementia ($t = -5.53, p < .001$). A summary of measure characteristics is presented in Table 3.

Confirmatory Factor Analysis

The 23-item A-ADS model indicated questionable to poor fit ($\chi^2 = 717.15$, $DF = 227$, $CMIN/DF = 3.16, p < .001$, $CFI = 0.76$, $RMSEA = 0.07$, $SRMR = 0.07$). Within the model there were seven items that had low standardised regression weight loadings (< 0.4), potentially warranting their removal (See Table 4). For the 13-item A-ADS, the model indicated improved, albeit adequate, fit ($\chi^2 = 182.75$, $DF = 65$, $CMIN/DF = 2.81, p < .001$, $CFI = 0.90$, $RMSEA = 0.07$, $SRMR = 0.05$). Only a single item within the model had a low loading ('We can do a lot now to improve the lives of people with dementia').

The 13-item A-ADS had a high internal consistency, $\alpha = 0.83$ (95% CI, 0.81 - 0.86). Removal of any single item would not have improved the overall internal consistency. The 13-item A-ADS had good concurrent validity with the total Allophilia scale ($r = 0.73, p < .001$). The 13-item A-ADS also had good predictive validity, $t = -6.34, p < .001$.

In comparison, the 23-item A-ADS had good internal consistency ($\alpha = 0.85$, 95% CI 0.83-0.87), good concurrent validity ($r = 0.76, p < .001$) and good predictive validity ($t = -6.01$,

$p < .001$). The 23-item A-ADS had a very strong, positive association with the 13-item version of the A-ADS ($r = .95, p < .001$).

Readability

The 13-item A-ADS had the following readability scores; Dale-Chall Formula = 6.5, Gunning Fog = 10.3, The Coleman-Liau Index = 8.54, and Flesch-Kincaid Grade = 6.7. After converting to readability estimates in years, there was an average readability age of 14.0 across the four indices.

Discussion

The aim of the present study was to revalidate, and potentially refine the A-ADS to develop a brief measure of dementia attitudes in adolescents, enabling it to be practically used in a school setting.

The EFA revealed that there was a potential for a two and five factor solution (depending on the statistical approach) within the A-ADS. However, theoretically there was no common theme linking the items, and many cross-loaded with the first factor, as such a single factor structure was deemed as being a better fit with the data. The CFA demonstrated that the 13-item A-ADS had a satisfactory model fit, and was an improvement over the original 23-item A-ADS. The fact that the 13-item A-ADS was very strongly associated with the 23-item A-ADS provides evidence that ultimately the 13-item A-ADS (hence forth called the Brief A-ADS) optimises the original scale.

The Brief A-ADS questionnaire is composed of a single factor and has a high internal consistency in both subsamples ($\alpha = 0.83-0.88$). It improves upon the internal consistency of the 'perceptions' factor of the original development paper ($\alpha = 0.61$) (Griffiths et al., 2018), and improved on the internal consistency of the A-ADS as a whole ($\alpha = 0.69$, self-calculated).

The Brief A-ADS shifts from being a three factor to a single factor structure. Although such an approach was driven by a more conservative statistical approach compared to the original development paper, the improved model fit and maintained psychometric properties is sufficient evidence to consider the use of the Brief A-ADS over the original A-ADS. In shortening the A-ADS, it is also possible that we may reduce participant burden (Rolstad et al., 2011) and response fatigue (Lavrakas, 2008).

Whilst shorter questionnaires may result in better response rates (Rolstad et al., 2011), the availability of a short questionnaire may also promote adoption for those working with young people. Removing the items loading onto '*empathy*' and '*sacrifice*' in the A-ADS theoretically loses some of the complexity of attitudes towards dementia. However, it is important to consider how the Brief A-ADS still ties in with the wider attitude literature. First, the measure captures both positive and negative attitudes, which could be important if we consider that attitudes might not sit on a single bipolar dimension (Alfieri and Marta, 2011). Second, the measure captures elements of '*public stigma*', such as '*discrimination*' and '*prejudice*' (Alzheimer's Disease International, 2019; Rüsch et al., 2005). Lastly, there are several items that capture behavioural intention; and whilst the intention-behaviour gap is large (Sheeran and Webb, 2016), they do predict future behaviour (Sheeran, 2002). Irrespective, researchers should be vigilant that the Brief A-ADS may not capture all elements related to dementia attitudes or stigma.

One strength of this study is the sample size, having a larger sample size than the original development paper (n=262)(Griffiths et al., 2018). The sample used for the EFA matched the 10:1 ratio in terms of sample size to number of items (Everitt, 1975). Admittedly the importance of meeting rule-of-thumb criteria has been discussed elsewhere (Hogarty et al., 2005; Williams et al., 2010).

It is important to acknowledge that when this study was conceptualised the A-ADS was the only validated questionnaire to capture dementia attitudes in adolescents. As such, Allophilia scale which was validate in adults (Kinney et al., 2017), is less than optimal to check for concurrent validity. Since this study was conceptualised, the KIDS has been developed and validated, capturing '*Personhood*', '*Stigma*' and '*Dementia Understanding*' (Baker et al., 2017). The KIDS has a similar number of items ($k=14$), internal consistency ($\omega_t = 0.83$), and measurement variance ($CV=14.88\%$) compared to the Brief A-ADS (Baker et al., 2017). However, unlike the A-ADS, KIDS was developed in Australian schoolchildren aged 10-12, potentially having implications on its applicability in the current sample. Early evidence indicates a moderate association between the KIDS and the Brief A-ADS ($r_s=0.47-0.67$) (Farina, Hughes, Jones, et al., 2020). Future research should compare the agreement between the two measures.

Within this current study, we adopted a split sampling approach, allowing us to capitalise on our large dataset. Such an approach, has been previously recommended (Anderson and Gerbing, 1988; Kyriazos, 2018). However, we should acknowledge the limitations of split-half sampling (Bandalos, 2017); not least because the two subsamples are likely to be very similar, therefore may not reflect the findings if the analysis was completed on two different samples. In fact, the findings are limited to a group of predominantly White British adolescents (aged 13-18), therefore until tested further, it unclear whether the Brief A-ADS validity in different settings and samples. This might include younger ages. The Brief A-ADS appears to have a readability appropriate for most adolescents (aged 14 years old). This does raise the possibility that the Brief A-ADS might be more difficult to read for those below this age, though anecdotally this did not appear to be the case in the 13 year olds within our sample. Another limitation of this research is the item reduction process used in the EFA. The creation of the Brief A-ADS was driven, in part, by looking at psychometric

properties. Certain thresholds have been recommended previously (e.g. absolute difference < 0.2 indicating large cross-loading; Ferguson and Cox, 1993), though strictly following such them could lead to different outcomes. Within this study we ensured that decisions were complimented by looking at underlying theoretical commonalities between items.

The Brief A-ADS contributes to a gap in the literature in terms of measuring dementia related stigma (Herrmann et al., 2018). Whilst there is no consensus about the ‘gold standard’ measure (Harper et al., 2019), particularly for a younger age group, providing transparent evidence of a measures development and validity is one step closer to achieve this. It should be acknowledged that there are some psychometric properties not reported here, most notably test-retest reliability and responsiveness. In addition, there is the need to understand the extent to which missing data effects the ability to score the Brief A-ADS. Therefore, there is scope for future research to continue the process of validating the Brief A-ADS.

Conclusions

The original A-ADS displayed good psychometric properties, however factor analysis reveals that by reducing the number of items, with a single factor structure provides a better fit. The Brief A-ADS is a short, standardised way of capturing attitudes towards dementia in adolescents. The initial test of validity and reliability of the Brief A-ADS has demonstrated that the scale effectively measures attitudes towards dementia amongst adolescents. The questionnaire could prove to be a useful tool in assessing attitude (and stigma) change in future dementia awareness initiatives aimed at adolescents, particularly in settings where participant time is limited, or large amounts of data are being collected. It is hoped that the development of this scale will lead to the greater use of validated scales within initiatives aimed at improving attitudes towards dementia. Notably, the Brief A-ADS has already been successfully used in one such initiative (Farina, Hughes, Jones, et al., 2020). Future

validation of the Brief A-ADS would be useful, particularly when considering responsiveness and test-retest reliability, before its use more widely, particularly within longitudinal studies.

Data Availability Statement

The data that support the findings of this study are available on reasonable request from the corresponding author. The data are not publicly available due to ethical restrictions, as consent was not obtained from participants to share data in this manner.

References

- Alfieri S and Marta E (2011) Positive attitudes toward the outgroup: adaptation and validation of the Allophilia scale. *Testing, Psychometrics, Methodology in Applied Psychology* 18(2): 99–116.
- Alzheimer's Disease International (2019) World Alzheimer Report 2019 : Attitudes to dementia. Available at: <https://www.alz.co.uk/research/world-report-2019> (accessed 17 June 2019).
- Alzheimer's Society (2008) *Dementia: out of the shadows*. London, England: Alzheimer's Society. Available at: [https://scholar.google.com/scholar_lookup?hl=en&publication_year=\(2008a\)&author=Alzheimer%27s+Society&title=Out+of+the+shadows](https://scholar.google.com/scholar_lookup?hl=en&publication_year=(2008a)&author=Alzheimer%27s+Society&title=Out+of+the+shadows) (accessed 21 November 2017).
- Alzheimer's Society (2012) *Dementia 2012*. London: Alzheimer's Society. Available at: http://www.alzheimers.org.uk/site/scripts/download_info.php?fileID=1389 (accessed 12 October 2015).
- Anderson JC and Gerbing DW (1988) Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin* 103(3): 411.
- Atkinson T and Bray J (2013) *Dementia Awareness & Intergenerational Exchange in Schools: A Pioneer Project supporting Dementia Friendly Communities*. University of Worcester. Available at: http://www.alzheimers.org.uk/site/scripts/download_info.php?fileID=2306.
- Baker JR, Low L-F, Goodenough B, et al. (2017) The Kids Insight into Dementia Survey (KIDS): development and preliminary psychometric properties. *Aging & Mental Health* 0(0): 1–7. DOI: 10.1080/13607863.2017.1320703.

- Baker JR, Goodenough B, Jeon Y-H, et al. (2018) The Kids4Dementia education program is effective in improving children's attitudes towards dementia. *Dementia*: 1471301217731385. DOI: 10.1177/1471301217731385.
- Bandalos DL (2017) *Measurement Theory and Applications for the Social Sciences*. Guilford Publications.
- Banerjee S, Farina N, Daley S, et al. (2017) How do we enhance undergraduate healthcare education in dementia? A review of the role of innovative approaches and development of the Time for Dementia Programme. *International Journal of Geriatric Psychiatry* 32(1): 68–75. DOI: 10.1002/gps.4602.
- Batsch NL and Mittelman MS (2012) *World Alzheimer Report 2012*. London, England: Alzheimer's Disease International.
- Chow S, Chow R, Yu C, et al. (2018) Dementia awareness for high school students: A pilot program. *International Public Health Journal; Hauppauge* 10(2): 189–195.
- Cowley K (2005) Assessing children's views of dementia. *Journal of Dementia Care* 13: 36–37.
- Department of Health (2009) *Living Well with Dementia: A National Dementia Strategy*. London: Department of Health.
- Di Bona L, Kennedy S and Mountain G (2017) Adopt a Care Home: An intergenerational initiative bringing children into care homes. *Dementia (London, England)*: 1471301217725420. DOI: 10.1177/1471301217725420.
- Docking RE and Stock J (2017) *International Handbook of Positive Aging*. Taylor & Francis.
- Everitt BS (1975) Multivariate analysis: the need for data, and other problems. *The British Journal of Psychiatry: The Journal of Mental Science* 126: 237–240. DOI: 10.1192/bjp.126.3.237.
- Farina N, Hughes LJ, Griffiths AW, et al. (2020) Adolescents' experiences and perceptions of dementia. *Aging & Mental Health* 24(7). Routledge: 1175–1181. DOI: 10.1080/13607863.2019.1613343.
- Farina N, Hughes LJ, Jones E, et al. (2020) The effect of a dementia awareness class on changing dementia attitudes in adolescents. *BMC Geriatrics* 20(1): 188. DOI: 10.1186/s12877-020-01589-6.
- Ferguson E and Cox T (1993) Exploratory Factor Analysis: A Users' Guide. *International Journal of Selection and Assessment* 1(2): 84–94. DOI: 10.1111/j.1468-2389.1993.tb00092.x.
- George DR, Stuckey HL and Whitehead MM (2013) An Arts-Based Intervention at a Nursing Home to Improve Medical Students' Attitudes Toward Persons With Dementia. *Academic Medicine* 88(6): 837. DOI: 10.1097/ACM.0b013e31828fa773.
- Glenn ND (1974) Aging and Conservatism. *The ANNALS of the American Academy of Political and Social Science* 415(1): 176–186. DOI: 10.1177/000271627441500113.

- Griffiths AW, Parveen S, Shafiq S, et al. (2018) Development of the Adolescent Attitudes towards Dementia Scale (A-ADS). *International Journal of Geriatric Psychiatry* 33(8): 1139–1145. DOI: 10.1002/gps.4907.
- Harper L, Dobbs BM, Stites SD, et al. (2019) Stigma in dementia: It's time to talk about it: There's much you can do to address stigmatizing attitudes, beliefs, and behaviors. *Current Psychiatry* 18(7): 16–24.
- Hebert CA and Scales K (2017) Dementia friendly initiatives: A state of the science review. *Dementia*: 1471301217731433. DOI: 10.1177/1471301217731433.
- Herrmann LK, Welter E, Leverenz J, et al. (2018) A Systematic Review of Dementia-related Stigma Research: Can We Move the Stigma Dial? *The American Journal of Geriatric Psychiatry* 26(3): 316–331. DOI: 10.1016/j.jagp.2017.09.006.
- Hogarty KY, Hines CV, Kromrey JD, et al. (2005) The Quality of Factor Solutions in Exploratory Factor Analysis: The Influence of Sample Size, Communality, and Overdetermination. *Educational and Psychological Measurement* 65(2): 202–226. DOI: 10.1177/0013164404267287.
- Horn JL (1965) A rationale and test for the number of factors in factor analysis. *Psychometrika* 30(2): 179–185. DOI: 10.1007/BF02289447.
- Iliffe S, De Lepeleire J, Van Hout H, et al. (2005) Understanding obstacles to the recognition of and response to dementia in different European countries: a modified focus group approach using multinational, multi-disciplinary expert groups. *Aging & Mental Health* 9(1): 1–6.
- Isaac MG, Isaac MM, Farina N, et al. (2017) Knowledge and attitudes towards dementia in adolescent students. *Journal of Mental Health* 26(5): 419–425.
- Kinney JM, Yamashita T and Brown JS (2017) Measuring positive attitudes toward persons with dementia: A validation of the Allophilia scale. *Dementia* 16(8): 1045–1060. DOI: 10.1177/1471301216633247.
- Kogan N (1961) Attitudes toward old people: The development of a scale and an examination of correlates. *The Journal of Abnormal and Social Psychology* 62(1): 44–54. DOI: 10.1037/h0048053.
- Krosnick JA and Alwin DF (1989) Aging and susceptibility to attitude change. *Journal of Personality and Social Psychology* 57(3): 416–425. DOI: 10.1037/0022-3514.57.3.416.
- Kyriazos TA (2018) Applied Psychometrics: The 3-Faced Construct Validation Method, a Routine for Evaluating a Factor Structure. *Psychology* 09: 2044. DOI: 10.4236/psych.2018.98117.
- Lavrakas P (2008) Respondent Fatigue. Thousand Oaks, California, United States of America: Sage Publications, Inc. DOI: 10.4135/9781412963947.n480.

- Lundquist TS and Ready RE (2008) Young Adult Attitudes About Alzheimer's Disease. *American Journal of Alzheimer's Disease and Other Dementias* 23(3): 267–273. DOI: 10.1177/1533317508317818.
- Marinova D (2013) Cultural alienation in the ageing person.
- Mental Health Commission of Canada (2013) Opening Minds Interim Report: Interim Report. Available at: <https://www.mentalhealthcommission.ca/English/document/17491/opening-minds-interim-report> (accessed 7 October 2019).
- Milne A (2010) The 'D' word: Reflections on the relationship between stigma, discrimination and dementia. *Journal of Mental Health* 19(3): 227–233. DOI: 10.3109/09638231003728166.
- Mortimer JT and Shanahan MJ (2006) *Handbook of the Life Course*. Springer Science & Business Media.
- Mukadam N and Livingston G (2012) Reducing the stigma associated with dementia: approaches and goals. *Aging Health* 8(4): 377–386. DOI: 10.2217/ahe.12.42.
- Nazir E and Bangash A (2015) Awareness raising in schools. *The Journal of Dementia Care* 23(2): 14–15.
- O'Connor BP (2000) SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instruments, & Computers* 32(3): 396–402. DOI: 10.3758/BF03200807.
- O'Connor ML and McFadden SH (2010) Development and Psychometric Validation of the Dementia Attitudes Scale. *International Journal of Alzheimer's Disease* 2010: e454218. DOI: 10.4061/2010/454218.
- Parveen S, Robins J, Griffiths AW, et al. (2015) Dementia Detectives: Busting the myths. *The Journal of Dementia Care* 23(4): 12–13.
- Patalay P, Hayes D and Wolpert M (2018) Assessing the readability of the self-reported Strengths and Difficulties Questionnaire. *BJPsych Open* 4(2): 55–57. DOI: 10.1192/bjo.2017.13.
- Pittinsky TL, Rosenthal SA and Montoya RM (2011) Measuring positive attitudes toward outgroups: Development and validation of the Allophilia Scale. In: *Moving beyond Prejudice Reduction: Pathways to Positive Intergroup Relations*. Washington, DC, US: American Psychological Association, pp. 41–60. DOI: 10.1037/12319-002.
- Rolstad S, Adler J and Rydén A (2011) Response burden and questionnaire length: is shorter better? A review and meta-analysis. *Value in Health: The Journal of the International Society for Pharmacoeconomics and Outcomes Research* 14(8): 1101–1108. DOI: 10.1016/j.jval.2011.06.003.
- Rüsch N, Angermeyer MC and Corrigan PW (2005) Mental illness stigma: concepts, consequences, and initiatives to reduce stigma. *European Psychiatry: The Journal of*

- the Association of European Psychiatrists* 20(8): 529–539. DOI: 10.1016/j.eurpsy.2005.04.004.
- Rylance R and Pendleton J (2015) Creating a dementia friendly generation. *Journal of Dementia Care* 23(2): 15.
- Scottish Government (2013) *Scotland's national dementia strategy: 2013–2016*. Available at: <http://www.gov.scot/Resource/0042/00423472.pdf>.
- Sheeran P (2002) Intention—Behavior Relations: A Conceptual and Empirical Review. *European Review of Social Psychology* 12(1): 1–36. DOI: 10.1080/14792772143000003.
- Sheeran P and Webb TL (2016) The intention–behavior gap. *Social and personality psychology compass* 10(9): 503–518.
- Velicer WF (1976) Determining the number of components from the matrix of partial correlations. *Psychometrika* 41(3). Springer: 321–327.
- Visser PS and Krosnick JA (1998) Development of attitude strength over the life cycle: surge and decline. *Journal of personality and social psychology* 75(6): 1389.
- Williams B, Onsmann A and Brown T (2010) Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine* 8(3). DOI: 10.33151/ajp.8.3.93.
- World Health Organisation (2017) *Dementia: A Public Health Priority*. Geneva, Switzerland: World Health Organization. Available at: http://www.who.int/mental_health/publications/dementia_report_2012/en/ (accessed 27 November 2017).
- Yong AG and Pearce S (2013) A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in quantitative methods for psychology* 9(2): 79–94.

Table 1. *Principal component analysis revealing a five factor structure (Eigenvalue > 1). Standardised loadings are reported (>0.3).*

#	Item	Component				
		1	2	3	4	5
1	I would volunteer to spend time with people with dementia	.695				-.306
2	I would be annoyed if my parents asked me to spend time with a family friend who has dementia rather than see my friends.	.631			.303	
3	I would donate my time or money to help people with dementia	.656			.329	
4	If I saw someone with dementia struggling to do something, I would help them	.527				
5	I do not think that people with dementia can make a positive contribution to society	.420		-.518	.336	
6	People with dementia deserve my sympathy and support more than people with other conditions		.397	.420		
7	I feel bad for people with dementia because they may have trouble remembering happy events and memories from their life.	.320	.459	.308		.304

8	It is rewarding to work with people who have dementia	.673		
9	People with dementia can be creative	.634		
10	I feel confident around people with dementia	.568	-.419	
11	I am comfortable holding hands with people with dementia	.689		
12	Every person with dementia has different needs	.526	.331	-.437
13	I would avoid a person with dementia who was all 'worked up'	.530		.388 .303
14	It is important to know the past history of people with dementia	.342	.445	
15	It is possible to enjoy spending time with people with dementia	.665		
16	I feel relaxed around people with dementia	.635	-.478	
17	People with dementia can enjoy life	.573		-.487
18	People with dementia can tell when others are kind to them	.433		-.377 -.417
19	I feel annoyed because I do not know how to help people with dementia		.499	.358
20	I cannot imagine looking after someone with dementia	.525	-.404	

21	I admire how people with dementia deal with things	.588	
22	We can do a lot now to improve the lives of people with dementia	.558	.333
23	I would feel uncomfortable being around people with dementia	.655	-.367

Items in bold reflect those retained in the 13-item A-ADS.

Table 2. *Principal component analysis forced two factor structure (based on MAP and parallel analysis). Standardised loadings are reported (>0.3).*

#		1	2
1	I would volunteer to spend time with people with dementia	.695	
2	I would be annoyed if my parents asked me to spend time with a family friend who has dementia rather than see my friends.	.631	
3	I would donate my time or money to help people with dementia	.656	
4	If I saw someone with dementia struggling to do something, I would help them	.527	

5	I do not think that people with dementia can make a positive contribution to society	.420	
6	People with dementia deserve my sympathy and support more than people with other conditions		.397
7	I feel bad for people with dementia because they may have trouble remembering happy events and memories from their life.	.320	.459
8	It is rewarding to work with people who have dementia	.673	
9	People with dementia can be creative	.634	
10	I feel confident around people with dementia	.568	-.419
11	I am comfortable holding hands with people with dementia	.689	
12	Every person with dementia has different needs	.526	.331
13	I would avoid a person with dementia who was all 'worked up'	.530	
14	It is important to know the past history of people with dementia	.342	.445
15	It is possible to enjoy spending time with people with dementia	.665	

16	I feel relaxed around people with dementia	.635	-.478
17	People with dementia can enjoy life	.573	
18	People with dementia can tell when others are kind to them	.433	
19	I feel annoyed because I do not know how to help people with dementia		.499
20	I cannot imagine looking after someone with dementia	.525	-.404
21	I admire how people with dementia deal with things	.588	
22	We can do a lot now to improve the lives of people with dementia	.558	
23	I would feel uncomfortable being around people with dementia	.655	-.367

Items in bold reflect those retained in the 13- item A-ADS

Table 3. *Characteristics of the 13-item A-ADS within the two samples.*

13-item A-ADS	Mean	SD	CV%	Min	Max	Skewness	Kurtosis
Sample 1 (n=230)	47.46	7.08	14.92	29	65	0.05	0.09
Sample 2 (n=400)	48.17	6.28	13.04	28	65	0.08	0.28

CV = Coefficient of variability

There was no significant difference between the 13 item A-ADS between samples ($t= 1.30$, $p=.19$).

Table 4. *Standardised regression weight loadings in Confirmatory Factor Analysis.*

A-ADS items	23-item, 3	13-item A-ADS	
	factor structure	23-item A-ADS	(single factor structure)
Q17. People with dementia can enjoy life	Empathy	0.398	-
Q7. I feel bad for people with dementia because they may have trouble remembering happy events and memories from their life	Empathy	0.265	-
Q6. People with dementia deserve my sympathy and support	Empathy	0.153	-
Q5. I do not think that people with dementia can make a positive contribution to society (R)	Empathy	0.327	-
Q23. I would feel uncomfortable being around people with dementia (R)	Sacrifice	0.666	0.545
Q20. I cannot imagine looking after someone with dementia (R)	Sacrifice	0.598	-
Q19. I feel annoyed because I do not know how to help people with dementia	Sacrifice	-0.038	-
Q21. I admire how people with dementia deal with things	Perceptions	0.434	0.435

Q18. People with dementia can tell when others are kind to them	Perceptions	0.464	-
Q16. I feel relaxed around people with dementia	Perceptions	0.547	0.495
Q15. It is possible to enjoy spending time with people with dementia	Perceptions	0.533	0.534
Q14. It is important to know the past history of people with dementia	Perceptions	0.331	-
Q13. I would avoid a person with dementia who was all 'worked up' (R)	Perceptions	0.416	-
Q12. Every person with dementia has different needs	Perceptions	0.471	0.476
Q11. I am comfortable holding hands with people with dementia	Perceptions	0.621	0.606
Q10. I feel confident around people with dementia	Perceptions	0.586	-
Q9. People with dementia can be creative	Perceptions	0.527	0.493
Q8. It is rewarding to work with people who have dementia	Perceptions	0.572	0.549
Q4. If I saw someone with dementia struggling to do something, I would help them	Perceptions	0.576	0.588

Q3. I would donate my time or money to help people with dementia	Perceptions	0.548	0.596
Q2. I would be annoyed if my parents asked me to spend time with a family friend who has dementia rather than see my friends. (R)	Perceptions	0.524	0.548
Q1. I would volunteer to spend time with people with dementia	Perceptions	0.621	0.662
Q22. We can do a lot now to improve the lives of people with dementia	Perceptions	0.348	0.345

Appendix A.

Scoring of the A-ADS and Brief A-ADS (SPSS syntax)

Note, variables should be labelled AADS_Q1 to AADS_Q23, and scored: 1= Strongly Disagree to 5 = Strongly Agree

RECODE Questions 2,5,13,20, and 23

RECODE AADS_Q2 AADS_Q5 AADS_Q13 AADS_Q20 AADS_Q23 (1=5) (2=4) (3=3) (4=2) (5=1) INTO
AADS_Q2_R AADS_Q5_R AADS_Q13_R AADS_Q20_R AADS_Q23_R.

EXECUTE.

Total A-ADS (23-item) score

COMPUTE AADS.Total= SUM.23(AADS_Q1, AADS_Q2_R, AADS_Q3, AADS_Q4, AADS_Q5_R,
AADS_Q6, AADS_Q7, AADS_Q8, AADS_Q9, AADS_Q10, AADS_Q11, AADS_Q12, AADS_Q13,
AADS_Q14, AADS_Q15, AADS_Q16, AADS_Q17, AADS_Q18, AADS_Q19, AADS_Q20_R, AADS_Q21,
AADS_Q22, AADS_Q23_R).

EXECUTE.

Total Brief A-ADS score

COMPUTE AADS.13=SUM.13(AADS_Q1, AADS_Q2_R, AADS_Q3, AADS_Q4, AADS_Q8, AADS_Q9,
AADS_Q11, AADS_Q12, AADS_Q15, AADS_Q16, AADS_Q21, AADS_Q22, AADS_Q23_R).

EXECUTE.